

Compensatory Cognitive Training and CogSMART for Veterans with Neuropsychiatric Conditions

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Disclosures

- None

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Carl Schy

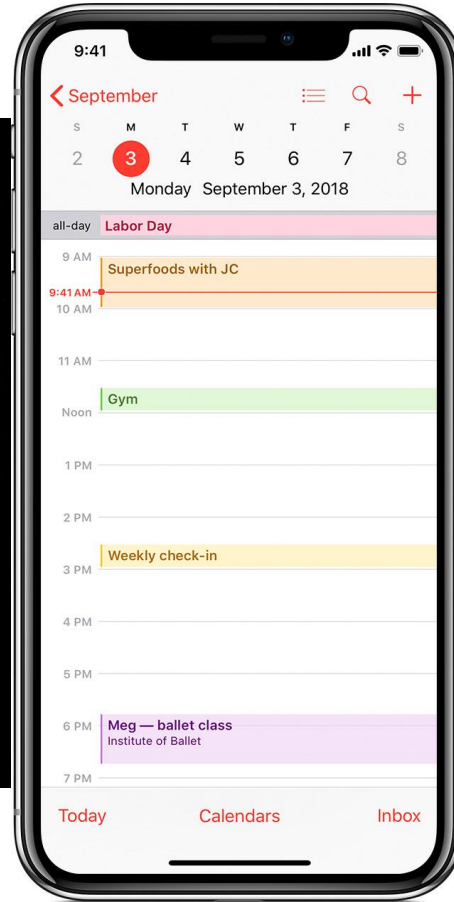


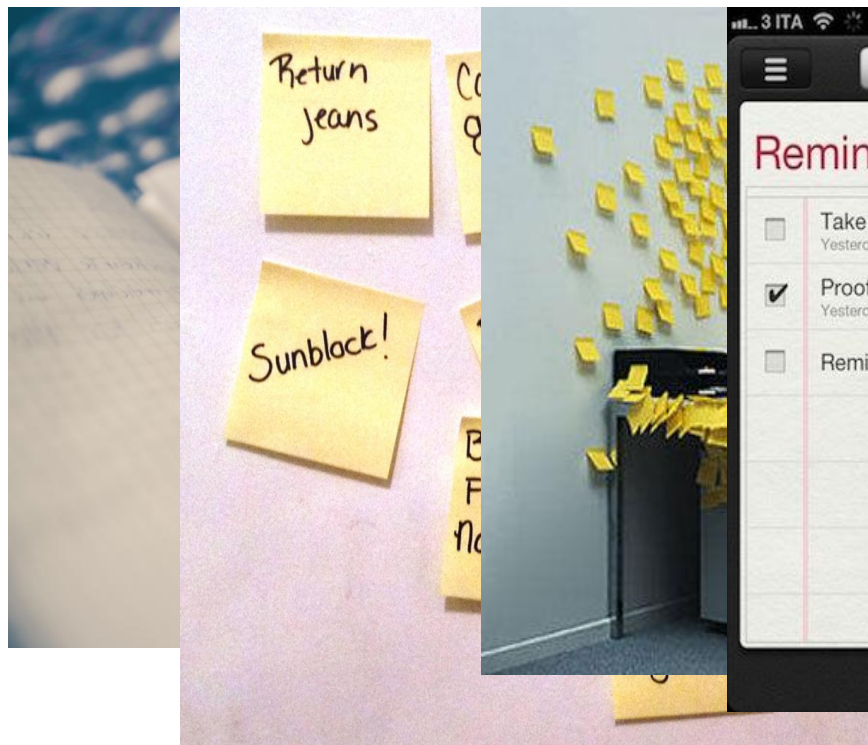
Learning Objectives

At the end of this presentation, learners will be able to:

1. Describe compensatory and restorative interventions to improve cognition in Veterans with neuropsychiatric disorders.
2. List domains of cognitive functioning targeted in Cognitive Symptom Management and Rehabilitation Therapy and Compensatory Cognitive Training (CogSMART/CCT).
3. Describe how to link cognitive strategies with individual rehabilitation goals.

Photo courtesy of
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CogSMART app (www.cogsmart.com)

The screenshot displays the CogSMART app's user interface. At the top is a dark blue navigation bar with the CogSMART logo on the left and links for HOME, ABOUT, FAQs, MANUALS and RESOURCES, and LOGOUT on the right. Below the navigation bar, the interface is divided into several sections. On the left, there is a 'Your Last Page' section showing 'Module 12: Skills Integration, Review, and Next Steps' on 'Page 257'. Below this is an 'All Modules' section listing 12 modules from 'Introduction to CogSMART' to 'Skills Integration, Review, and Next Steps'. On the right, there is a 'Your Bookmarks' section showing 'Page 30' and 'Page 28' with delete buttons. Below that is a 'Your Goals' section with a bulleted list of goals: 'Getting A in my classes', 'Paying off a credit card debt', and 'Do not miss any appointment and deadline'. Underneath is a 'Your To Do List' section with a 'Create New' button. At the bottom right is a 'Your Strategies' section with a bulleted list: 'Will use calendar', 'Will use brainstorming', and 'Will use association'.

CogSMART HOME ABOUT FAQs MANUALS and RESOURCES LOGOUT

Your Last Page

Module 12: Skills Integration, Review, and Next Steps
Page 257

All Modules

Module 1: Introduction to CogSMART, Getting Organized, and Prospective Memory
Module 2: Prospective Memory continued
Module 3: Short-term Prospective Memory
Module 4: Conversational Attention
Module 5: Paying Attention during Tasks
Module 6: Learning and Memory
Module 7: Learning and Memory
Module 8: Learning and Memory
Module 9: Cognitive Flexibility and Problem-Solving
Module 10: Cognitive Flexibility and Problem-Solving
Module 11: Cognitive Flexibility, Problem-Solving, and Planning
Module 12: Skills Integration, Review, and Next Steps

Your Bookmarks

Page 30 delete
Page 28 delete

Your Goals

- Getting A in my classes
- Paying off a credit card debt
- Do not miss any appointment and deadline

Your To Do List

Create New

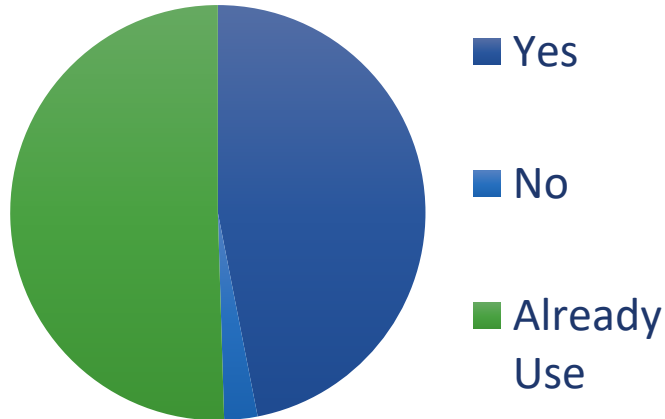
Your Strategies

- Will use calendar
- Will use brainstorming
- Will use association

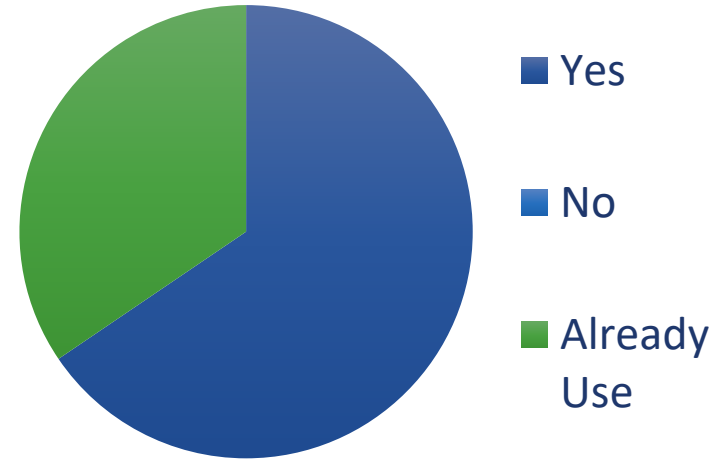
- Free web-based app
- 12 modules
- Each module includes text, videos, and practice exercises
- Videos also available on CogSMART YouTube channel

App user data

Will you try using a calendar?



Will you try writing things down?



Review of rationale and
development of
CogSMART/CCT

A light blue downward-pointing arrow with a subtle gradient, indicating a flow from the first box to the second.

Results from previous
studies

A light blue downward-pointing arrow with a subtle gradient, indicating a flow from the second box to the third.

CogSMART/CCT overview

Who What When
Where Why

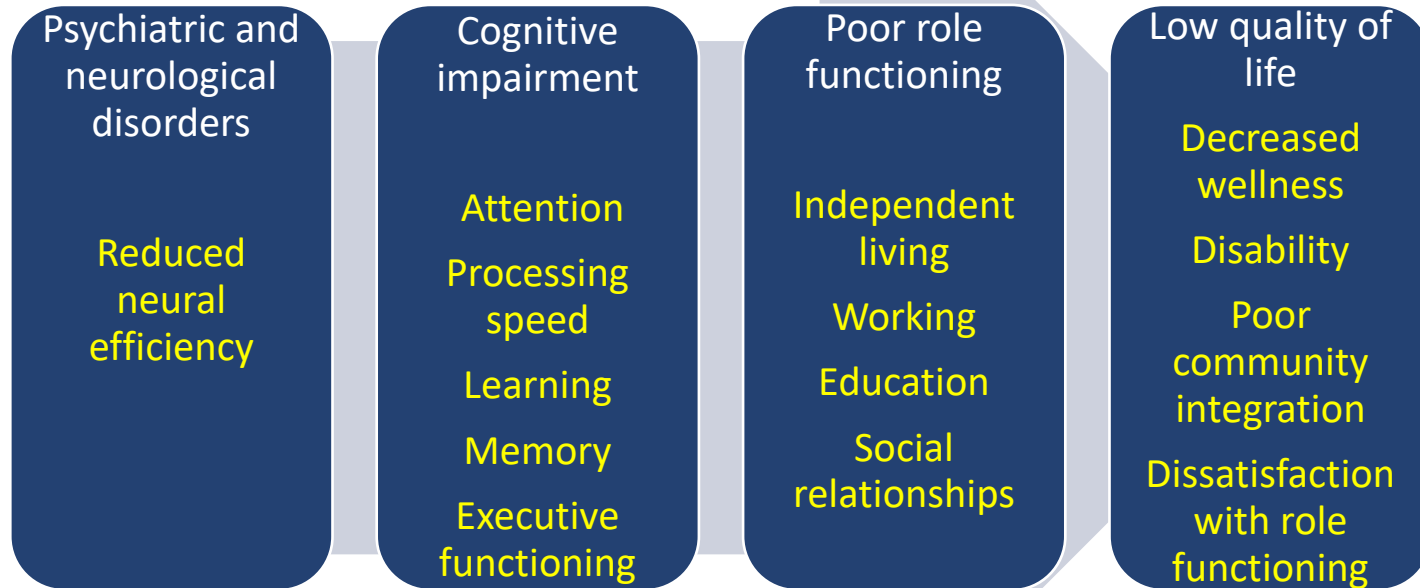
THE BACKGROUND

Neuropsychiatric disorders have cognitive consequences

- All psychiatric disorders are brain disorders
 - Bipolar disorder
 - Major depression
 - PTSD
 - Any psychiatric illness robs the brain of resources as the brain works to keep symptoms under control
- Acquired brain injury (TBI, stroke)
- Mild cognitive impairment (MCI) and dementia

Rock et al., 2014, Psychol Med; Bora et al., 2013, Psychol Med; Bora, 2018, J Affect Disord; Schuitevoerder et al., 2013, J Anxiety Disord

Why focus on treatment of cognitive impairments?



- Underappreciation of cognitive impairments and their downstream effects on functioning and quality of life
- Cognitive impairments limit recovery and treatment response
- Psychiatric service users may need cognitive support skills to engage in and benefit from treatment and reach their mental health recovery goals

CogSMART / Compensatory Cognitive Training

Cognitive Rehabilitation Manuals

RCTs show positive effects on:

- Cognitive performance
- Psychiatric and post-concussive symptoms
- Quality of life

San Diego Trials

- People with psychosis / psychosis with severe negative symptoms
- People with any severe mental illness
- Youth with prodromal psychosis
- Young adults with autism
- Older people with hoarding disorder
- Veterans with TBI / PTSD+TBI
- Homeless Veterans with mental health conditions
- Older Veterans with MCI
- Veterans with Parkinson's Disease

International trials in Oslo, Reykjavik, Montpellier, Ottawa, China

Translations now available:

Spanish,
Portuguese,
Japanese,
Icelandic,
Norwegian,
French, Arabic,
Hindi, Chinese

CogSMART/CCT manuals downloaded

>5000 times from
cogsmart.com; used
in many VA, DoD,
and community
facilities

CogSMART web-based app

went live in June
2018

800 downloads in 3
months

Next steps:

Implementation
science

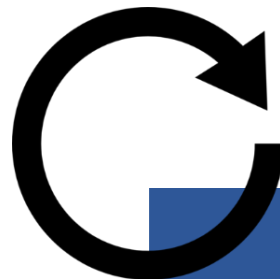
Integration with
robotics

Theoretical approaches to cognitive training



Restorative

- “Bottom up” processing
- Restore functioning of neural circuitry underlying impaired cognition
- Typically computerized, hierarchical, drill and practice approaches
- Portable, relatively easy to administer
- Generalizable?



Compensatory

- “Top down” processing
- Not intended to restore, but rather work around or compensate for cognitive impairment
- Typically group- or individual-based strategy training
- Real world applicability and generalizability
- Cost? Provider intensive?

Cognitive Symptom Management and Rehabilitation Therapy (CogSMART) and Compensatory Cognitive Training (CCT)

- Different from restorative “brain training” interventions
- Not intended to restore, but rather work around or compensate for cognitive impairment
- Typically group- or individual-based strategy training
- Real world applicability and generalizability

Cognitive compensation

- “Working around” deficits by reducing cognitive demands or handling them differently

Habit learning

- Habits are particularly resistant to forgetting
- Uses intact neostriatal pathways rather than declarative memory

Restorative and other approaches to cognitive training

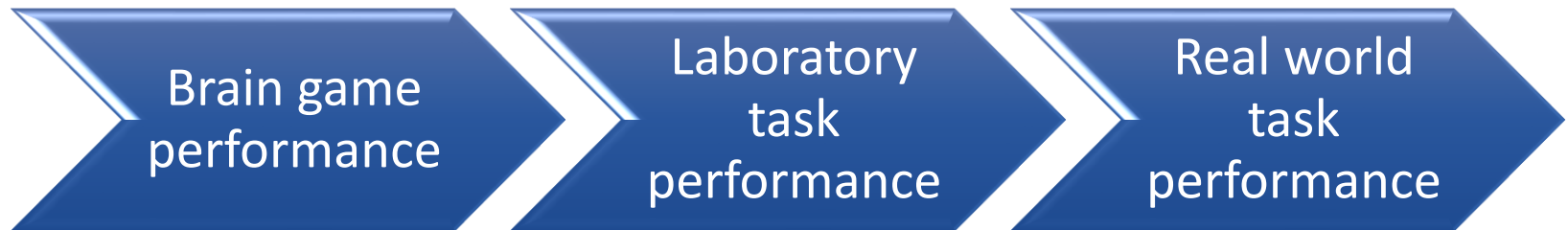


COGMED



Restorative brain games

- A \$3.3 billion industry in 2020
- Controversial claims: Training for 10-15 minutes 3-4x/week helps users achieve “full potential in every aspect of life”
- Popular media: “Brain training for 10 hours has lasting benefits up to 10 years”
- Plentiful evidence for “near transfer”
- Less compelling evidence for “far transfer”
- Effectiveness hotly debated by scientists



One advertisement



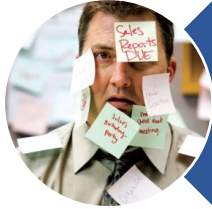
Why use the compensatory approach?

- The cause of the cognitive impairments is not important
- Compensatory strategies help people work around cognitive impairments and have the potential to induce brain plasticity
- It is recovery-oriented in its focus on linking strategy use to goals and roles in the community
- Everyone uses compensatory strategies; it's not "therapy"
- Habits and routines are powerful
- Evidence of improvement in cognition as well as generalization to functional outcomes

CogSMART/CCT interventions

- Once a week for 8-12 weeks, individual/group
- Manualized, low-tech, practical, portable
- Individualized approach elicits real-world cognitive problems and links strategies taught to the person's rehabilitation goals
- Homework is assigned weekly
- There is also a free, self-guided CogSMART app

CogSMART/CCT domains



Prospective
Memory



Learning and
Memory



Conversational
and Task
Attention



Executive
Functioning /
Cognitive Flexibility

- Why these 4?
 - Important for everyday functioning and quality of life
 - Modifiable
 - A good fit for Veterans with TBI and/or PTSD?

CogSMART/CCT modules

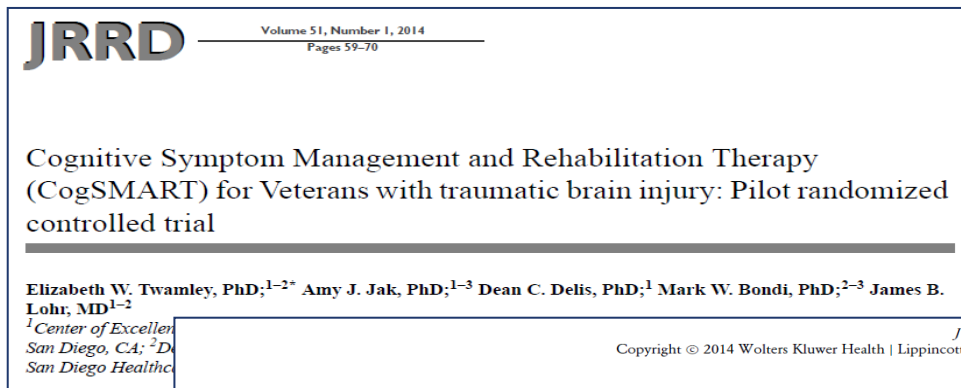
Cognitive Ability	Compensatory Strategies
Prospective memory	Using calendars and reminders in the environment, linking tasks
Conversational and task attention	Conversation skills, using 'self-talk' to stay focused during tasks
Verbal learning and memory	Reducing info (e.g., writing things down), making info meaningful, name-learning skills
Executive functioning / Cognitive flexibility	Brainstorming, 6-step problem-solving method, planning to meet goals/deadlines

Results from Previous Studies

THE SCIENCE

CogSMART/CCT for TBI RCTs

- Postconcussive symptoms
($d = 0.97, 0.64$)
- Prospective memory
($d = 0.72, 0.55$)
- Quality of life
($d = 1.0$ @ 12 mos)



CogSMART Compensatory Cognitive Training for Traumatic Brain Injury: Effects Over 1 Year

Elizabeth W. Twamley, PhD; Kelsey R. Thomas, MS; Amy J. Jak, PhD; Mark W. Bondi, PhD; Dean C. Delis, PhD; James B. Lohr, MD

J Head Trauma Rehabil
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Small to medium effects on:

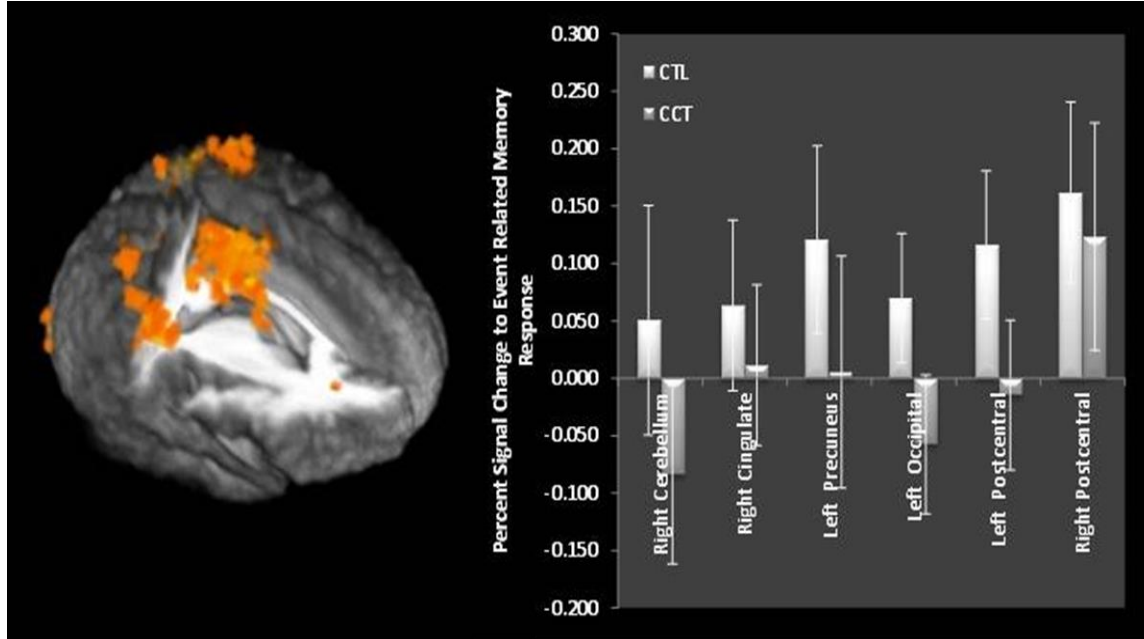
- Attention (Digit Span, $\eta^2=0.048$)
- Learning (HVLt-R, $\eta^2=0.054$)
- Exec (letter fluency, $\eta^2=0.076$)

Compensatory Cognitive Training for Operation Enduring Freedom/Operation Iraqi Freedom/Operation New Dawn Veterans With Mild Traumatic Brain Injury

Daniel Storzbach, PhD; Elizabeth W. Twamley, PhD; Mai S. Roost, PhD; Shahrokh Golshan, PhD; Rhonda M. Williams, PhD; Maya O'Neil, PhD; Amy J. Jak, PhD; Aaron P. Turner, PhD; Halina M. Kowalski, MA; Kathleen F. Pagulayan, PhD; Marilyn Huckans, PhD

J Head Trauma Rehabil
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Neuroimaging results in mild TBI sample



CCT-associated reduction of activation in bilateral parietal and occipital cortex during an event-based prospective memory task.

CCT may improve neural efficiency for processing event-based information. (Simmons et al., 2013, Society for Neuroscience)

Clinical Problem: Providers unprepared to treat Veterans with PTSD+TBI

- Which treatment should occur first?
- Should they occur simultaneously? Could they even be integrated?
- Should we adapt PTSD treatments for Veterans who may have TBI-related cognitive impairments?

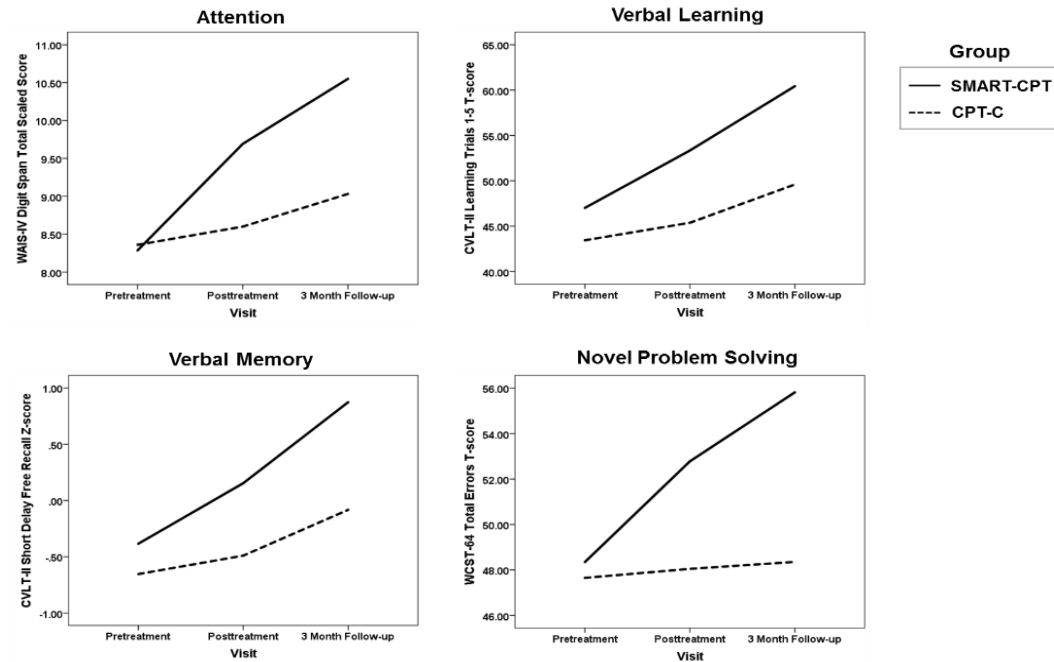


Enhanced Cognitive Rehabilitation to Treat Veterans with Comorbid TBI and PTSD (SMART-CPT; Jak et al., 2019)

- SMART-CPT is cognitive processing therapy (CPT) with some additions to address cognitive impairments
 - CogSMART compensatory strategies for organization, attention, memory, planning
 - Visually enhanced worksheets
 - Within-session summaries
- SMART-CPT takes 15 hours completed in 12 weeks vs. 24 hours for CPT and CogSMART separately
- Ensures that Veterans get treatment and increases efficiency for both Veteran and clinic

SMART-CPT Methods and Results

- 100 Veterans with PTSD+TBI
- RCT of SMART-CPT vs. standard CPT; assessments at baseline, 12 weeks, and 24 weeks
- Results: equivalent PTSD symptom outcomes, plus objective cognitive improvement in the SMART-CPT group



What about CogSMART/CCT for PTSD?

- Maya O'Neil, PhD (Portland VA) is conducting an RCT... stay tuned

Techniques You Can Use

THE TREATMENT

Session format

- Review homework from previous session and discuss generalization to everyday life, job search, or job performance
- Introduce new skills and establish rationale
- Practice skills
- Assign homework

Goals are elicited in 1st session

6. Think about your goals for the course

1. What are one or two **problems with cognition or thinking** that affect you most (e.g., problems remembering things, focusing, poor organization)?

2. What **important life areas do these problems interfere with** the most (e.g., work, family relationships, managing your affairs, taking care of your health)?

3. Identify one or two **important life goals** you would like to work toward during this course (e.g., returning to work or school, being more reliable at work, helping out more at home, remembering medications and appointments).

Goals are #1

- Get to know goals really well and link strategies to goals very clearly
- Elicit goals to get buy-in
 - Living, learning, working, socializing
 - Financial? Health?
 - Specific, Measurable, Achievable, Relevant, Time-bound (SMART goals)

Overt linkage of strategies to goals

4. How memory strategies can help with long-term goals

Think back to those life goals that you wrote down on page 8. How will the learning and memory strategies we've covered help you achieve those goals?

How are cognitive strategies linked to goals?

- Using a calendar efficiently will help you plan your job search activities or work/school assignments, go to work/class on time, call your best friend on their birthday, pay the rent on time, and generally get things done.
- Using conversational attention skills will help your relationships with your family members, friends, partners, or bosses by making sure that other people feel heard and understood; these skills will also help you remember your conversations better.
- Learning and memory strategies can help you learn and remember new information at home, work, and school.
- Executive functioning strategies can help you with planning, prioritizing, problem-solving, and thinking flexibly. These skills are important in managing your tasks in life, whether they involve work, school, relationships, health, finances, or living independently.

Who benefits from CogSMART/CCT?

- Few identified predictors of response
- PTSD/depression/substance use symptoms do not moderate response (Pagulayan et al., 2017)
- In another study, improvement was correlated with worse baseline scores on measures of cognitive performance, symptom severity, functional capacity, and self-rated quality of life, cognitive problems, and strategy use
 - People who have worse cognition and more severe illness burden may improve more
- Race, ethnicity, gender, age, years of education, and other demographic factors do not appear to predict response

Identifying good candidates for CogSMART/CCT

- Veterans with functional goals, who have some cognitive impairments/declines, and are interested in improving attention, memory, organization
- Assume all people with psychiatric illness have some cognitive weaknesses, some decline, or are not using all the strategies available
- Build insight regarding links between cognitive functioning and goal attainment

Things I tell clinicians

- Be flexible; the manual is a guide
 - You can devote more time to areas of greater concern or relevance, and less time on strategies already used well
 - Feel free to add your own examples or strategies!
- Use motivational interviewing techniques to elicit buy-in
- Have people SHOW you what they can do
- Be ready to teach voice commands / reminders / calendar on iPhone and Android
- Brainstorm with service users and clinicians to choose and implement strategies or create your own
- If people are willing, have them try the app: www.cogsmart.com
- And/or show videos from CogSMART channel on YouTube

Things I tell service users

- You may already use some of these strategies or even a lot of them
 - We will work toward making the strategies work as best they can, in the service of your goals, and making them automatic and habitual
 - Even elite athletes get coaching to improve; even if you know how to use a strategy, chances are good that you can still improve
- You don't have to use all the strategies; learn them all, and then see which ones work best for you

How people use strategies

I love the overlearning strategy to remember names. I made flashcards for each new person I met at my AA meetings. On the back of the card, I'll write down their phone number and personal details. I'm meeting more people and socializing with them. I'm having a social life outside of my addiction for the first time in two and a half years.

Self talk is a learning tool. It's not like talking back to voices. If you do it for instructions or a task, it's normal.

My calendar helps me to mark off my morning pills – I can check to see that I took them.

Paraphrasing makes my conversations more interesting. Normally I would just say, 'Is that right?' but now I'm a more active participant.

I went from not checking my sugars daily (maybe every other day or I would skip a few days) to checking every day or twice a day. I write my sugar levels down in my calendar.

[The calendar] gives me peace of mind. I make notes to myself about ordering prescriptions and household duties.

CogSMART Veteran service users say...

- When asked if they would recommend the intervention to others in the same situation, 100% of Veteran service users answered “yes”
- “Made my daily life less stressful”
- “Excellent tools for managing daily life”
- “It has established a routine that helps me daily”
- “I am now more organized”
- “This by far has been one of my best therapies”
- “It has taken a lot of pressure off my wife because she doesn’t have to keep up with my schedule and it has given me confidence to go to school”
- “It helped me with fixing my credit, staying on top of class work, and applying for competitive jobs”



Conclusions

- CogSMART/CCT interventions can be useful to people with different causes of cognitive impairments
- Improvements found in cognitive performance, functional capacity, post-concussive and psychiatric symptoms, and quality of life
- CogSMART/CCT techniques do not “train to the test,” suggesting that these strategies generalize to actual cognitive performance and downstream effects
- Solutions to brain-based problems may be simpler than we think
 - Strategies that successful people use every day
 - Skills we assume everyone has, but they don’t

Thank you to BBRF/NARSAD, NIMH, DoD, VA, NSF, IBM, and the best collaborators, trainees, and staff on the planet



All manuals available free of charge at www.cogsmart.com
Links to reports on randomized controlled trials: smartlab.ucsd.edu

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